BATTERY CONTROL ELECTRONIC MODULE

FRED FLOR

SMITHS AEROSPACE, INC.
Electronic Systems - Long Island
tel: 631-467-5500, ext 347

engineering value in aerospace

Battery Control Electronic Module

- Key Features
  - Charger:
    - Uses unregulated DC bus power
    - Reduce battery capacity fade
    - Extends battery maintenance interval
    - Adaptable to Sealed Lead Acid or NiCd batteries

© PROPRIETARY INFORMATION OF SMITHS AEROSPACE INC.
www.smiths-aerospace.com

Battery Control Electronic Module

- Key Features
  - Limiter:
    - Provides un-interruptible power during loss of DC buss
    - Fills in any “holes”

© PROPRIETARY INFORMATION OF SMITHS AEROSPACE INC.
www.smiths-aerospace.com

Battery Control Electronic Module

- Electrical Characteristics:
  - Constant current : 30 Ampere max.
  - Constant potential: 28.5 Volt nominal @ 15 Ampere max.

© PROPRIETARY INFORMATION OF SMITHS AEROSPACE INC.
www.smiths-aerospace.com

Battery Control Electronic Module

- Limiter Fill-in Characteristics:
  - 60 Ampere of current for 50ms, prior to Contactor closure
  - Voltage drop < 1.25 Volts at 50 Ampere

© PROPRIETARY INFORMATION OF SMITHS AEROSPACE INC.
www.smiths-aerospace.com

Battery Control Electronic Module

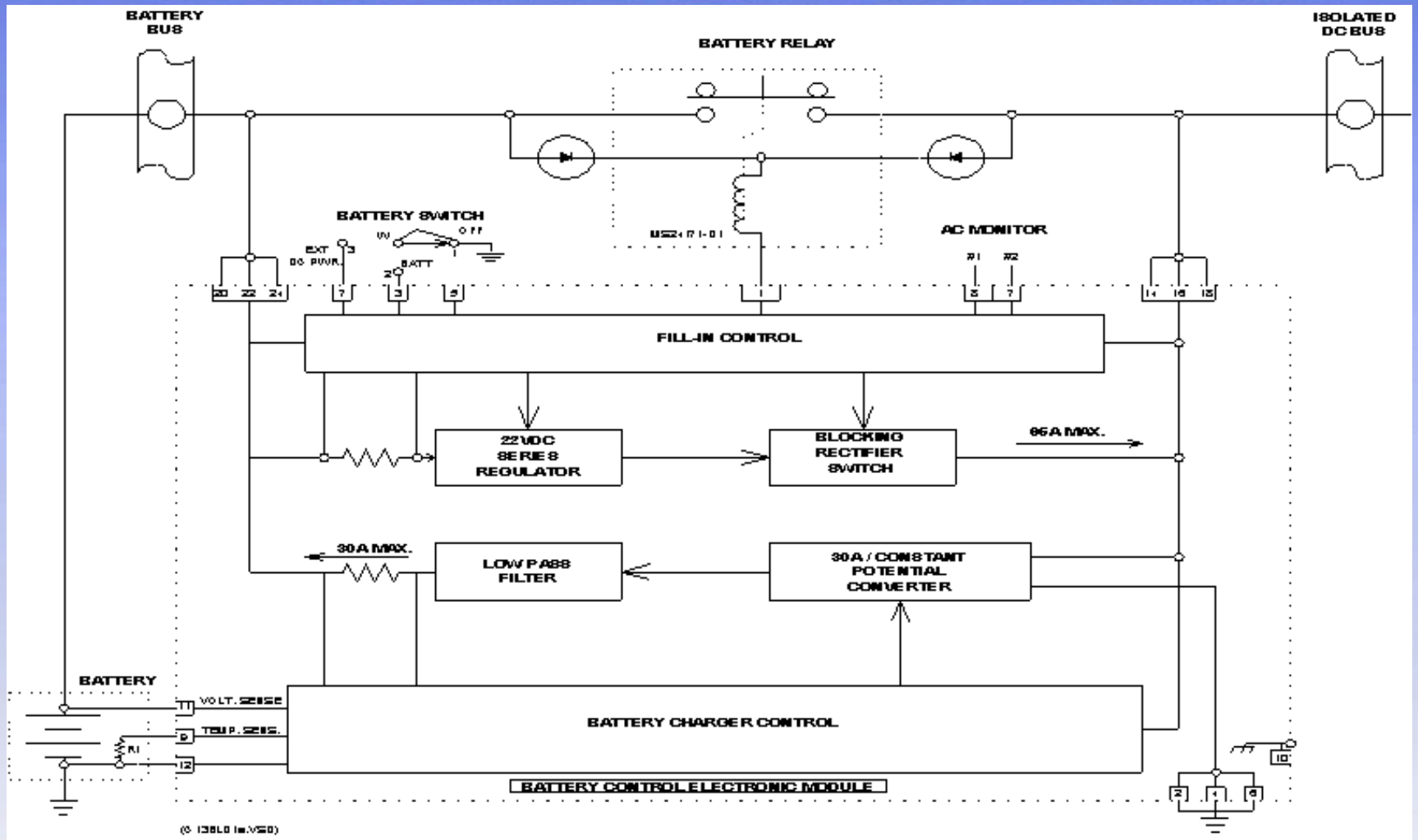
- Physical Characteristics:
  - Size: 10 in. long x 9 in. wide x 3 in. high
  - Weight: 10.0 pounds (4.6 kg) max.
  - Cooling: Convection

© PROPRIETARY INFORMATION OF SMITHS AEROSPACE INC.
www.smiths-aerospace.com

Battery Control Electronic Module

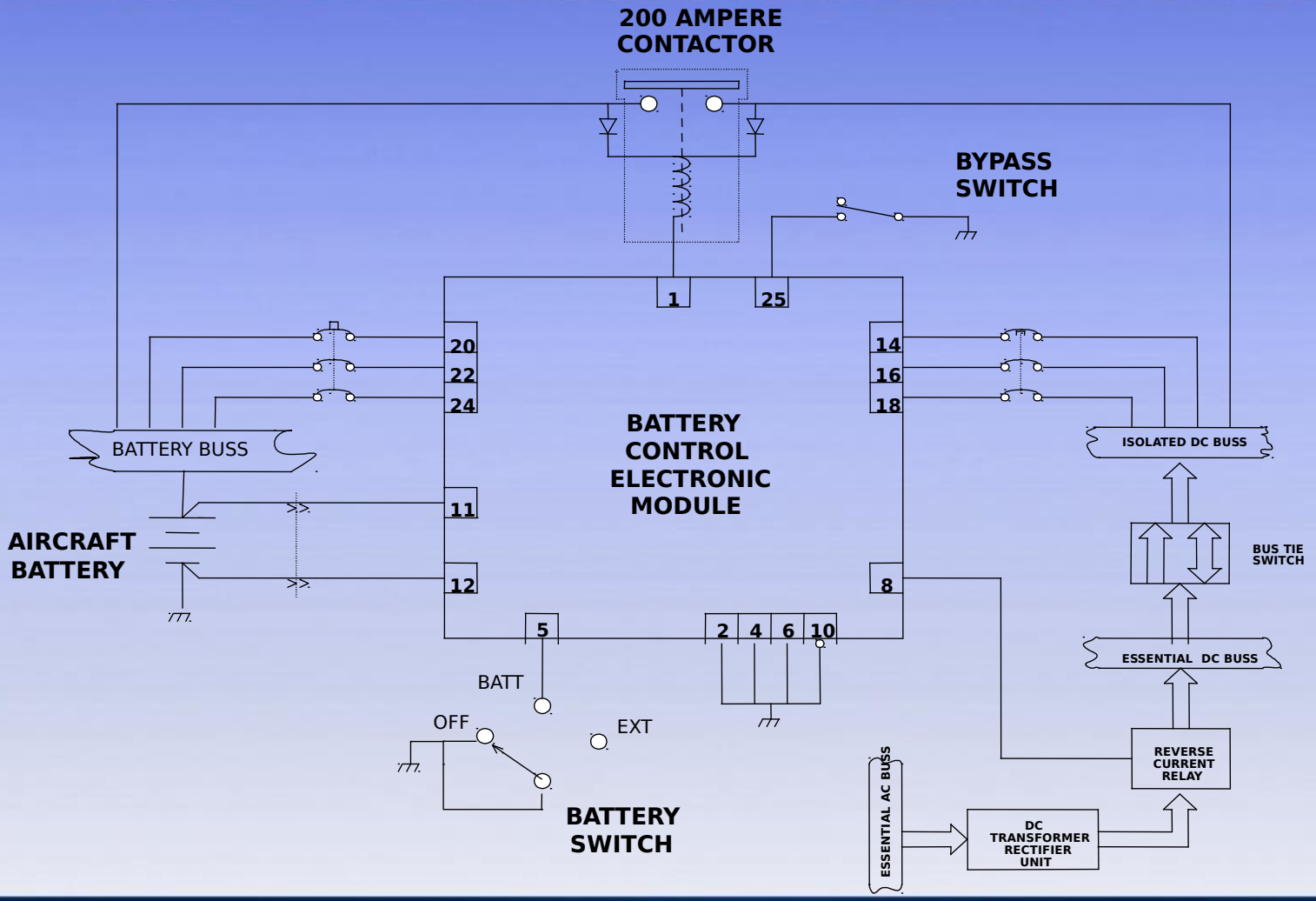
© PROPRIETARY INFORMATION OF SMITHS AEROSPACE INC.
www.smiths-aerospace.com

Battery Control Electronic Module



© PROPRIETARY INFORMATION OF SMITHS AEROSPACE INC.

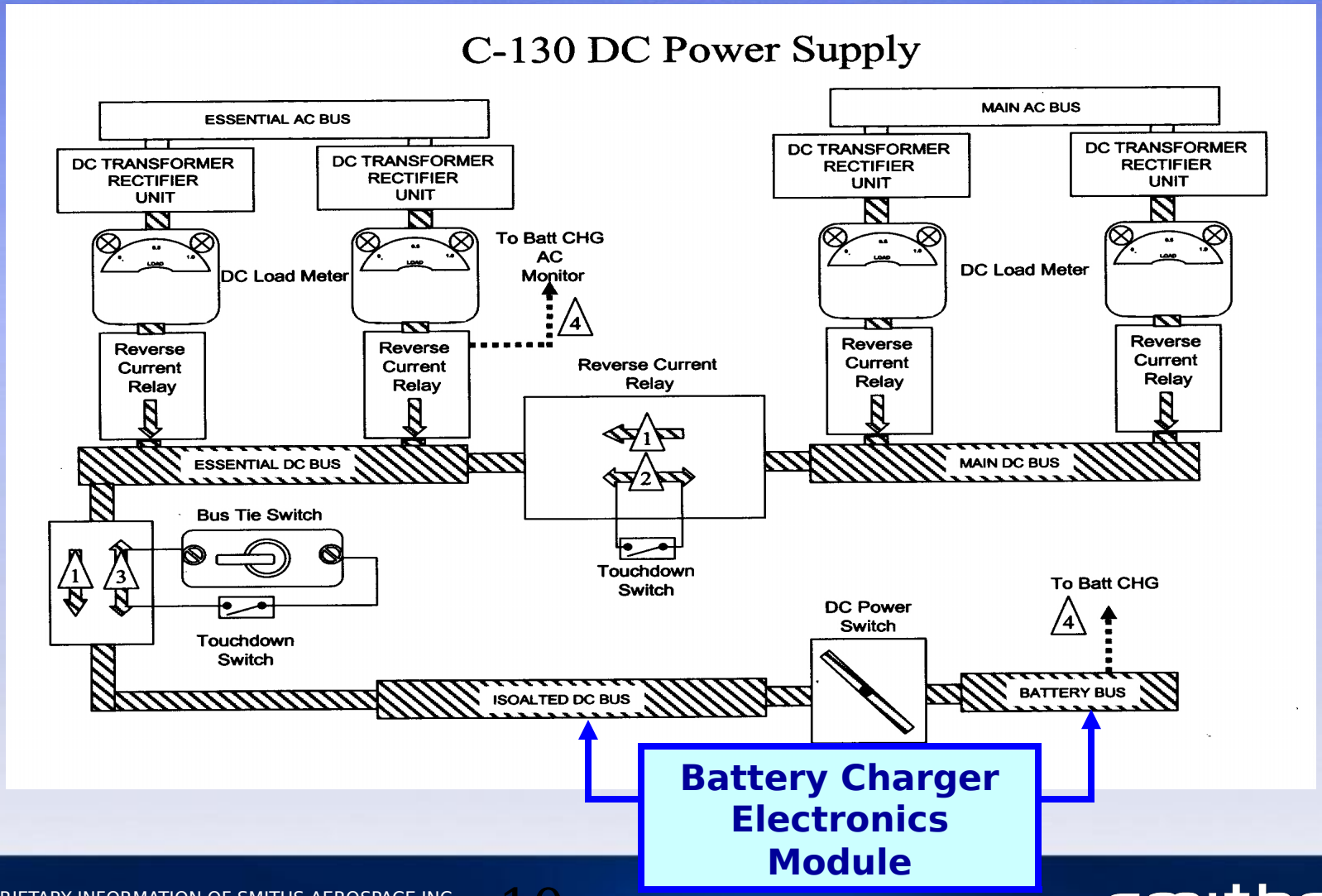
Battery Control Electronic Module



© PROPRIETARY INFORMATION OF SMITHS AEROSPACE INC.
www.smiths-aerospace.com

smiths

Battery Control Electronic Module



© PROPRIETARY INFORMATION OF SMITHS AEROSPACE INC.
www.smiths-aerospace.com

smiths

Battery Control Electronic Module

- Test Program
  - Mansfield Air National Guard Unit
    - Two C-130's Modified - January 2001
    - Flight Testing Started in March 2001
    - Scheduled to be a 1 Year Program
    - Equipment removed in October 2002

© PROPRIETARY INFORMATION OF SMITHS AEROSPACE INC.
www.smiths-aerospace.com

Battery Control Electronic Module

- Test Program (cont)
  - Mansfield Air National Guard Unit
    - Batteries
      - Maintenance Free Lead Acid (30 A-H)
        - 1 New Battery S/N R49803
        - 1 Used Battery S/N R41390

© PROPRIETARY INFORMATION OF SMITHS AEROSPACE INC.
www.smiths-aerospace.com

Battery Control Electronic Module

- Initial Battery Conditioning and Capacity Check
  - Discharge Batteries
    - Constant Current to 18vdc
  - Re-charge Batteries
    - Constant Potential
    - Rest

© PROPRIETARY INFORMATION OF SMITHS AEROSPACE INC.
www.smiths-aerospace.com

Battery Control Electronic Module

- Initial Battery Conditioning and Capacity Check (cont)
  - Measure Initial Capacity
    - Discharge Constant Current to 18VDC
  - Battery Initial Capacity
    - Battery S/N R49803 - 45 Amp-Hours
    - Battery S/N R41390 - 37.5 Amp-Hours

© PROPRIETARY INFORMATION OF SMITHS AEROSPACE INC.
www.smiths-aerospace.com

Battery Control Electronic Module

CAPACITY CHECK	AC#1 BATTERY S/N R49803 RESIDUAL CAPACITY	AC#2 BATTERY S/N R41390 RESIDUAL CAPACITY	MONTH/YR
INITIAL	45 A-H	37.5 A-H	JAN '01
	Flight Test Evaluation Started		MAR '01
30 DAYS	36 A-H	37.5 A-H	APR '01
90 DAYS	39 A-H	37.5 A-H	JUN '01
180 DAYS	37.5 A-H	39 A-H	SEP '01
360 DAYS	33 A-H	22.5 A-H	MAR '02
570 DAYS	Equipment successfully removed from the aircraft with no Battery anomalies or malfunctions		OCT '02

© PROPRIETARY INFORMATION OF SMITHS AEROSPACE INC.
www.smiths-aerospace.com

Battery Control Electronic Module

- Test Summary
  - Aircraft #90-1794 flew 864.3 Hours without a Battery malfunction or anomaly
  - Aircraft #90-1795 flew 715.9 Hours without a Battery malfunction or anomaly

© PROPRIETARY INFORMATION OF SMITHS AEROSPACE INC.
www.smiths-aerospace.com

Battery Control Electronic Module

- Test Summary (cont)
  - Of the remaining 6 Aircraft at Mansfield, there were 8 instances of premature battery failure or low voltage problems on 4 aircraft. Two unmodified aircraft had no battery problems.

© PROPRIETARY INFORMATION OF SMITHS AEROSPACE INC.
www.smiths-aerospace.com

Battery Control Electronic Module

- For more information contact:
  - Fred Flor - Engineer
    - tel: 631-467-5500 x347
    - fred.flor@smiths-aerospace.com
  - Joseph McHugh - Marketing
    - tel: 631-467-5500 x291
    - joseph.mchugh@smiths-aerospace.com
  - Visit www.smiths-aerospace.com

© PROPRIETARY INFORMATION OF SMITHS AEROSPACE INC.
www.smiths-aerospace.com